

3.7 SOCIOECONOMICS

This section characterizes population, housing, and economic conditions, including employment, income, local government revenues, and property values in Kittitas County. It identifies and discusses potential population in-migration and housing impacts. Employment demand and resulting economic impacts generated by the KVVPP are also evaluated, as well as the project's estimated revenue and cost impacts on Kittitas County agencies and potential impacts on property values.

The analysis in this section is based on information provided by the Applicant in the ASC (Sagebrush Power Partners LLC 2003a, Section 8.1). Population and housing data for this section were collected, reviewed, and summarized from a variety of sources. They included state government publications and U.S. Census Bureau data.

The primary source of economic data reviewed was the October 2002 study entitled *Economic Impacts of Wind Power in Kittitas County* prepared for the Phoenix Economic Development Group (Phoenix Group) (ECONorthwest 2002). The Phoenix Group is a cooperative public/private nonprofit association established to provide leadership that stimulates business and promotes economic opportunities to support the needs of Kittitas County (Washington State Employment Security Department 2002a). The ECONorthwest report evaluated the potential economic impacts of both the KVVPP and the Desert Claim projects, based on an initial proposal that the KVVPP consisted of 110 wind turbines and the Desert Claim project consisted of 150 wind turbines. The ECONorthwest data were modified to extract information specific to the KVVPP for inclusion in the Application to EFSEC (Sagebrush Power Partners LLC 2003a, Section 8.1).

Since these reports were published, the sizes of both the KVVPP and Desert Claim projects have been modified; therefore, relevant data were updated for inclusion in this EIS based on an assumed linear relationship between jobs, income, taxes, and revenue estimates and the number of wind turbines to be constructed. Several studies that evaluated the effect of wind development on nearby property values were also reviewed and summarized (Renewable Energy Policy Project 2003; ECONorthwest 2002; Jørgensen 1996; and Damborg 2002).

3.7.1 Affected Environment

Population

Population estimates for Kittitas County and Washington State are presented in Table 3.7-1. In 2000, the population of Kittitas County was 33,362. Between 1990 and 2000, the county population increased at an annual rate of 2.2%. During the same period, the state's population increased at an annual rate of 1.9%.

The State of Washington's Office of Financial Management (OFM) currently projects that the county population will continue to grow through the year 2020. However, the actual rate of growth is projected to slow to approximately 1.1% annually. During the same period, the state's population is forecast to grow at an annual rate of about 1.2%.

Table 3.7-1: Kittitas County and Washington State Population

Area	1990	2000	Average Annual Growth, 1990-2000	2020 Forecast	Forecast Average Annual Growth, 2000-2020
Kittitas County	26,725	33,362	2.2%	41,776	1.1%
Washington State	4,866,692	5,894,121	1.9%	547,276	1.2%

Source: Washington State Office of Financial Management 2002a, 2002b.

As shown in Table 3.7-2, nearly 92% of the county's population is Caucasian. The state's population is 82% Caucasian. The project area's population has a lower percentage of people of Hispanic origin than the state has. Approximately 5% of the county's residents are of Hispanic origin, compared to approximately 7.5% for the state (Sagebrush Power Partners LLC 2003a, Section 8.1.2.2).

Table 3.7-2: Kittitas County Demographic Breakdown of Population by Race

Area	Caucasian	African-American	American Indian, Eskimo, or Aleutian	Asian or Pacific Islander	Other Race	Two or More Races
Kittitas County	91.8%	0.7%	0.9%	2.3%	2.3%	2%
Washington State	81.8%	3.2%	1.6%	5.9%	3.9%	3.6%

Source: U.S. Census Bureau 2002.

Housing

Table 3.7-3 displays the estimated number of housing units for Kittitas County and for Washington State. From 1990 to 2000, housing in the county grew at an average annual rate that was slightly greater than the state's rate of growth. The number of housing units increased at an average annual growth rate of 2.2%, with the number of housing units increasing from 13,215 in 1990 to an estimated 16,475 in 2000 (Sagebrush Power Partners LLC 2003a, Section 8.1.2.1)

Table 3.7-3: Housing Units in Kittitas County and Washington State

Location	Housing Units		% Average Annual Growth 1990-2000	Number of Vacant Units, 2000	
	1990	2000		Total Vacant Units	Seasonal, Recreational, or Occasional Use
Kittitas County	13,215	16,475	2.2%	3,093	1,791
Washington State	2,032,378	2,451,075	1.9%	179,677	60,355

Source: U.S. Census Bureau 2002.

As of the 2000 Census, Kittitas County had 3,093 vacant housing units. Of the total vacant units, 1,791 were classified as seasonal, recreational, or occasional use. The occasional use units represent approximately 10.9% of the total units in the county. These units are generally lake or hunting cabins, quarters for seasonal workers, or time-share units. In Washington State, 2.5%,

were designated as seasonal, recreational, or occasional use units (U.S. Census Bureau 2002). The higher percentage of occasional use units in the county is attributed to the recreational areas located in the Cascades and other areas of the county (Sagebrush Power Partners LLC 2003a, Section 8.1.2.1).

Of the total units available for rent in the county in 2000, the U.S. Census reported a vacancy rate of 6.8% for Kittitas County. This vacancy rate is consistent with the vacancy rate reported by the Washington Center for Real Estate Research, which reported an apartment vacancy rate range from a high of 7% in September 2001 to a low of 3.9% in March of 2002. The higher vacancy rate experienced in September could be explained by the fact that Central Washington University's academic year generally begins at the end of September (Sagebrush Power Partners LLC 2003a, Section 8.1.2.1). By comparison, the statewide rental vacancy rate was 5.9% (U.S. Census Bureau 2002).

The estimated number of people per household in the county was 2.3 in 2000. This is less than the state's average of approximately 2.5 persons per household (U.S. Census Bureau 2002).

Employment

Table 3.7-4 displays average employment by industry for Kittitas County and Washington State. In 2000, an estimated 11,822 people were employed in the county. Employment in the study area was concentrated in the government, trade, and service sectors. The government sector (including local, state, and federal employees) accounts for approximately 31% of total employment in the study area, while trade (including wholesale and retail) and services account for 28 and 19%, respectively.

Table 3.7-4: Kittitas County and Washington State Employment by Industry, 2000

Industry	Kittitas County		Washington State	
	Employment	Percentage of Total	Employment	Percentage of Total
Agricultural, Forestry, and Fishing	811	6.9	91,530	3.4
Construction and Mining	433	3.7	152,790	5.7
Manufacturing	683	5.8	345,830	12.8
Transportation, communication, and utilities	432	3.7	139,684	5.2
Trade (wholesale and retail)	3,279	27.7	633,936	23.5
Finance, insurance, real estate, and services	2,194	18.6	880,985	32.6
Government	3,717	31.4	458,482	17
Not Elsewhere Classified	273	2.3	NA	NA
Total	11,822	100	2,703,237	100

Source: Washington Employment Security Department 2002.

Recent unemployment rate trends for Kittitas County and Washington State are shown in Table 3.7-5. In 1996, the average unemployment rate for the county exceeded the state's rate by more than 2 percentage points, 8.6% versus 6.5%. By 1999, strong economic growth had resulted in decreases in the unemployment rates for both the county and state to 5.6% and 4.7%,

respectively. With the recession beginning in 2001, unemployment rose in both the county and state. The 2001 unemployment rate was 6.5% in Kittitas County and 6.4% in Washington State (Sagebrush Power Partners LLC 2003a, Section 8.1.2.3). However, the 2002 average unemployment rate for Kittitas County dropped to 6.2% while the state unemployment rate rose to 7% (U.S. Bureau of Labor Statistics and Real Estate Center at Texas A&M University 2002).

Table 3.7-5: Unemployment Rate Trends in Kittitas County and Washington State, 1996-2001

Area	1996	1997	1998	1999	2000	2001
Kittitas County	8.6%	6%	6%	5.6%	5.8%	6.5%
Washington State	6.5%	4.8%	4.8%	4.7%	5.2%	6.4%

Source: Washington Employment Security Department 2002.

Economic Conditions

Per Capita Income

In 2000, the per capita income of Kittitas County residents of \$21,196 was about 68% of the state average of \$31,230 (Table 3.7-6). From 1997-2000, the county's per capita income grew at an annual rate of 3.1%, compared to the statewide rate of 4.2%. In 1999, approximately 19.6% of county incomes were below the 1999 federal poverty level of \$8,240 for one person less than age 65 or \$16,700 for a family of four. This exceeded the state average of 10.6% (Kittitas County 2002c).

Table 3.7-6: Kittitas County Per Capita Income (1997-2000)

Area	1997	1998	1999	2000	% Average Annual increase (1997-2000)	% of State Total (2000)
Kittitas County	18,781	19,738	20,164	21,196	3.1	67.9
Washington State	26,469	28,285	29,819	31,230	4.2	NA

Source: U.S. Bureau of Economic Analysis 2002.

Tax Rates and Distribution

Kittitas County depends primarily on sales and property tax revenues to fund government operations and services. Recent trends in taxable retail sales in Kittitas County and Washington State are compared in Table 3.7-7. In 2001 (the last year complete data were recorded), retail sales in the county totaled approximately \$388 million (Washington Department of Revenue 2002a). From 1998 to 2001, retail sales in the county increased at an average annual rate of 1.5%. Over the same period, sales statewide increased at an annual rate of 3.4%. Both the county and the state experienced a decline in taxable retail sales from 2000 to 2001. This decrease in

retail sales is likely attributed to the overall slowdown in the regional and national economies (Sagebrush Power Partners LLC 2003a, Section 8.1.2.6).

Table 3.7-7: Kittitas County and Washington State Taxable Retail Sales, 1998-2001 (\$000s)

Area	1998	1999	2000	2001	Avg. Annual % Change 1998-2001
Kittitas County	365,318	367,900	392,536	387,724	1.5
Washington State	73,865,218	79,683,553	84,747,510	84,356,940	3.4

Source: Washington Department of Revenue 2002c.

The Kittitas Valley Wind Power Project site lies within unincorporated Kittitas County. The total assessed value of property in Kittitas County in 2001 was approximately \$2.2 billion (Washington Department of Revenue 2002b). Private property within the unincorporated county is taxed at a variety of individual levy rates for state government and multiple-county government purposes, and includes levy rates for applicable fire district, school district, and other special purposes. The 2001 average consolidated tax per thousand dollars of assessed value for the county was about \$10.67.

Revenues from property taxes are used to fund Kittitas County government, local school districts, local fire departments, libraries, and emergency medical services. These property tax revenues are also a major source of revenue for the local governments. Incorporated into the consolidated tax levy are local levies collected by the County Assessor and returned to the local jurisdictions as general fund revenues (Sagebrush Power Partners LLC 2003a, Section 8.1.2.5).

In 2001, the Kittitas County general fund had revenues of about \$11 million (Washington State Auditor 2001). As shown in Table 3.7-8, approximately 48% of the revenue is expected to come from taxes. Other sources of revenue include licenses and permits, fines and forfeits, and intergovernmental transfers. Real and personal property taxes are forecast to be the largest contributors to revenues. Property taxes, which account for about 28% of total revenues, generated about \$3.1 million in revenues. Sales and use taxes are expected to total approximately \$2 million in 2001, providing approximately 18% of total revenues for the general fund (Sagebrush Power Partners LLC 2003a, Section 8.1.2.7).

Table 3.7-8: Kittitas County General Fund, Total Resources (2001)

Resources	2001	Percentage of Total Resources
General Property Tax	\$3,113,040	28
Sales and Use Tax	\$2,010,140	18.1
Other Local Taxes	\$241,668	2.2
Licenses and Permits	\$593,398	5.3
Charges and Fees for Service	\$823,701	7.4
Interest on Investments	\$596,142	5.4
Fines and Forfeits	\$1,387,397	12.5

Table 3.7-8: Continued

Resources	2001	Percentage of Total Resources
Miscellaneous	\$208,728	1.9
Intergovernmental Revenues	\$2,131,520	19.2
Total Resources	\$11,105,734	100

Source: Washington State Auditor 2001.

3.7.2 Impacts of Proposed Action

This section describes impacts on housing, population, and economic conditions under the proposed action. Direct impacts would result from increases in population, increased demand for housing (both from construction and operational employment in-migration), and increased income and jobs added to the local economy. The project's direct effect on property values also is discussed. Indirect impacts would result from increases in indirect and induced income and jobs added to the local economy. However, project-induced economic activity is not expected to result in indirect population growth and a related demand for housing capacity.

The project would generate both direct and indirect effects on local tax revenues. However, because tabular data are presented for projected total revenues (includes the sum of direct and indirect effects), the projects' effects on local government taxation and revenues are addressed below under "Indirect Operations and Maintenance Impacts." Table 3.7-9 summarizes potential socioeconomic impacts for the three scenarios under the proposed action. Detailed socioeconomic tables, including tables that distinguish direct versus indirect and induced employment and income impacts, are presented in the sections that follow.

Table 3.7-9: Summary of Potential Socioeconomic Impacts

	82 Turbines/3 MW (Lower End Scenario)	121 Turbines/1.5 MW (Middle Scenario)	150 Turbines/1.3 MW (Upper End Scenario)
Construction Impacts			
Increased temporary population	Same as middle scenario	Construction workforce of 253 employees; maximum 177 workers would be in-migrants to project area	Same as middle scenario
Increased demand for temporary housing	Same as middle scenario	Maximum 160 construction workers (112 non-local) during peak construction month	Same as middle scenario
Increased jobs added to local economy (Kittitas County)	+/- 10 to 15% compared to middle scenario	82 total jobs	+/- 10 to 15% compared to middle scenario
Increased income added to local economy (Kittitas County)	+/- 10 to 15% compared to middle scenario	\$5.7 million total income	+/- 10 to 15% compared to middle scenario

Table 3.7-9: Continued

	82 Turbines/3 MW (Lower End Scenario)	121 Turbines/1.5 MW (Middle Scenario)	150 Turbines/1.3 MW (Upper End Scenario)
Operation Impacts			
Increased permanent population in Kittitas County	Same as middle scenario	Maximum 16 individuals would be in-migrants to Kittitas County	Maximum 23 individuals would be in-migrants to Kittitas County
Increased demand for permanent housing in Kittitas County	Same as middle scenario	6-7 new families in Kittitas County	9-10 new families in Kittitas County
Changes to local property values	Negligible	Negligible	Negligible
Increased jobs added to local economy (Kittitas County)	+/- 10 to 15% compared to middle scenario	24 jobs annually	+/- 10 to 15% compared to middle scenario
Increased income added to local economy (Kittitas County)	+/- 10 to 15% compared to middle scenario	\$1.9 million total income annually	+/- 10 to 15% compared to middle scenario
Increase in local property tax revenue	+/- 10 to 15% compared to middle scenario	\$1.34 million total property tax revenue annually	+/- 10 to 15% compared to middle scenario
Increase in additional local tax revenue	+/- 10 to 15% compared to middle scenario	\$323,400 million total additional indirect tax revenue annually	+/- 10 to 15% compared to middle scenario

Source: Sagebrush Power Partners LLC 2003a, Section 8.1.3, as amended by Sagebrush Power Partners LLC 2003c.

Although economic effects are fully quantified for the middle scenario, quantifiable economic impacts for the lower and upper end scenarios are not available at this time. Indirect and induced employment and income impacts to Kittitas County for both the construction and operations phases of the project for the middle scenario were determined using the IMPLAN input-output model developed by the U.S. Department of Agriculture (in cooperation with other federal agencies) with data specific to Kittitas County. This model requires the input of several discrete variables, including the amount of local spending on construction materials and on equipment and materials to operate the wind turbines, and the amount of spending on food and lodging for non-local labor brought to Kittitas County for the construction period. Another model input variable is the amount of income to property owners that rent land for the wind turbines.

Specific model inputs have not been developed for the lower end (i.e., 82 turbine) or upper end (i.e., 150 turbine) scenarios. Therefore, estimates for employment and income effects in Kittitas County from the lower end and upper end scenarios have not been quantified. Similarly, an estimate of potential tax revenues generated under the lower and upper end scenarios has not been conducted; therefore, the potential effects on the local tax base under these two scenarios have not been quantified. However, it is reasonable to assume that the margin of error surrounding the value of the model inputs used for the middle scenario would be about +/- 10 to 15%, and that the input values for the lower and upper end scenarios would fall within this range. Therefore, the employment, income, and tax revenue effects of the lower and upper end scenarios during construction and operations would be +/- 10 to 15% of the quantified middle scenario (Taylor, pers. comm., 2003). Further quantification would resolve uncertainty associated with this issue (see Section 1.7, Issues to be Resolved).

Direct Construction Impacts

The planned construction schedule for the project spans approximately 12 to 14 months from the time of site certification to commercial operation (Taylor, pers. comm., 2003). Construction of the substation transformers and wind turbines would require the longest lead time, usually requiring 8 to 12 months from time of order to delivery of the transformers, and 5 to 7 months for the wind turbines (Sagebrush Power Partners LLC 2003a, Section 2.12.2).

The total workforce required during project construction would be approximately 253 employees under all three project scenarios. During the peak construction month, it is expected that about 160 personnel would be onsite at once as multiple disciplines of contractors complete their work simultaneously (Sagebrush Power Partners LLC 2003a, Section 2.13.2). The size and duration of the peak workforce would not change as a result of using larger or smaller turbines. The size of the peak workforce is driven more by the completion deadline than the size of the turbines. For example, while larger turbines would require more labor hours to construct, there would be fewer of them, so the number of employees required would be approximately equivalent (Taylor, pers. comm., 2003).

The project site is within commuting distance of Ellensburg in Kittitas County (approximately 12 miles away) and Yakima in adjacent Yakima County (within a one-hour drive). The Applicant's *Application for Site Certification* asserts that the majority of the construction workers would originate from the Ellensburg and Yakima area (Sagebrush Power Partners LLC 2003a, Section 5.2.2.1.1). However, construction personnel would also likely be hired from the Seattle/Tacoma area, in which case the commute distance would be somewhat longer (about 1.5 to 2 hours). These workers would probably be "weekend commuters" staying in recreational vehicle (RV) parks and motels near the job site during the workweek. In addition, because more specialized skills required for certain construction activities, such as turbine erection and turbine testing, may not be available in the local or state labor pools, a small percentage of the workforce may be brought in from out of state. These employees would likely work on a short-term basis, residing in nearby motels or RV parks for the duration of their assignments, or arranging monthly rentals.

During the EIS scoping process, several commentors expressed concern about the source of the labor pool that would construct the project. For example, some commentors requested that the document address impacts under different scenarios, including a scenario with only out-of-area contractors building the project and a scenario with local contractors and local craftsmen performing the majority of construction work. Other commentors asked if the Applicant would provide assurances that local craftsmen would perform the majority of construction work or would require that construction workers be paid prevailing wages set by the state for Kittitas County. The Applicant has not hired a contractor at this time but would select one through a competitive process prior to construction. Any additional details on hiring, training, wages, and other aspects of the construction labor force are beyond the scope of this EIS.

Assumptions in this analysis regarding construction workforce origins were derived from data on the Stateline Wind Project in nearby Walla Walla County (Walla Walla County 2002). The Stateline EIS assumed that 50% of construction workers would be hired locally (for that project, from within Benton and Yakima counties, Washington) and the remainder from outside the local

area. For the purposes of this EIS, it is conservatively assumed that 50 to 70% of construction workers would originate from outside Kittitas and Yakima counties, and that these employees would have a demand for temporary accommodations in the project area. Given these assumptions, it is expected that during the peak month of construction, a maximum of approximately 80 to 112 construction workers would require temporary housing in the general vicinity of the project site. A subset of the estimated total of 80 to 112 non-local workers would be workers who would temporarily relocate to the project area from outside the region. It is also expected that up to 10% (16 individuals) of the peak month construction workforce for the KVVPP would be specialized craftsmen from out-of-state areas.

Population

Project construction would require a total workforce of 253 employees. As shown in Figure 3.7-1, labor requirements would vary monthly during the estimated 12- to 14-month construction period. In the first month of the construction period, the project would employ approximately 6 workers. The construction workforce would increase rapidly to 130 workers in the fifth month of construction, then climb to a peak of 160 in the ninth month. Construction employment would then decrease rather rapidly, falling to 90 workers in the tenth month and 30 workers by the fourteenth month. Average monthly employment over the entire construction period would be approximately 75 workers.

Temporary population impacts from the project would be a function of the extent of worker relocation and in-migration needed to meet project labor demands. In turn, the project is dependent upon the ability of the local labor supply to meet this demand. As described above, it is assumed that between 30 to 50% of the construction workforce would originate from the Ellensburg and Yakima areas. In 2001, Kittitas and Yakima counties had an aggregate civilian labor force of over 122,000 people (Washington State Employment Security Department 2002a, b). This figure broadly represents the size of the local labor pool from which the Kittitas Valley Wind Power Project would draw workers for project construction.

The local construction labor force available when the KVVPP begins, including both workers currently employed in construction and unemployed workers with construction skills, represents one of the primary sources of workers for the project. However, given the unique project requirements, some construction labor would need to be imported from outside the region to fill specialized jobs. The EPC contractor would bring in additional employees with sufficient skills in constructing wind power projects to ensure that sufficient critical skilled labor is available. For example, turbine erection, including hoisting the nacelle and securing the blades, would require highly specialized labor that would be temporarily imported from out-of-state during the wind turbine assembly and erection phase of construction (estimated to last approximately 6 months) (Taylor, pers. comm., 2003). For purposes of this analysis, it is assumed that approximately 25 out-of-state workers (about 10% of the total construction workforce) would be required during the course of construction.

Figure 3.7-1:

Temporary population impacts in the project area would be minimal as a result of project construction. Assuming that 30% of the construction workers would reside within Kittitas or Yakima County and that they would commute daily to the project site, a maximum of 177 new workers would be temporary residents (in-migrants) in the project area. Given the accelerated construction schedule (about one year) and the fact that many workers would be present at the project site only during certain construction phases, it is assumed that the majority of workers would not be accompanied by families or others. Because the projected number of temporary in-migrants (177 employees) would be small compared to overall county population (33,362 in 2000), no significant impacts on population are anticipated. Because the project would not generate additional development, no indirect impacts on population are anticipated.

Housing

As many as 177 non-local workers could be employed at the project site over the course of construction, with an estimated peak month non-local workforce of up to 112 workers. At time of hire, these workers would likely reside in relatively distant employment centers such as the Seattle-Tacoma metropolitan area, beyond normal daily commuting distance from the project site, or would be temporarily imported from outside the state. Project construction workers originating from outside the local area (i.e., Kittitas and Yakima counties) would probably choose one of two options with respect to residence and work location:

1. They could retain their current residence and commute to the project area on a weekly basis, staying in short-term (transient) accommodations during the work week; or
2. They could temporarily relocate to rental housing (non-transient accommodations) in the project area for the duration of their employment.

Either scenario would depend primarily on the length of the individual's assignment. Those with relatively short-term jobs requiring their presence on the project site for only a few months would be more likely to commute on a weekly basis, while those with longer-term jobs would be more likely to relocate temporarily.

It is not known where the new temporary residents associated with project construction would settle and what type of housing they would select. It is assumed that residents would select housing based on a variety of factors including cost, accessibility to the project site, and accessibility to goods and services. Typical temporary worker housing options include campgrounds and other areas where workers can park trailers or other mobile housing, motels and hotels, and apartments or other short-term rental homes.

As discussed in Section 3.6, Land Use and Recreation, the results of a telephone survey conducted in 2002 of hotel, motel, RV Park, and campgrounds in Kittitas County to identify the supply of transient accommodations indicated that there are 1,150 rooms or sites available in the county. The results indicate further that during the peak summer season, there are typically about 240 rooms or sites vacant at any one time. During the non-summer months, vacancy rates are higher and it is estimated that there are usually around 760 rooms or sites vacant at any one time (CH2M Hill and Sagebrush Power Partners LLC 2002). This analysis assumes that as many as 112 non-local workers could be employed at the project site during the peak construction month

(this includes potential out-of-state workers). Even if all non-local workers (including out-of-state employees) were to seek transient accommodations, it is anticipated that there would be an adequate supply of short-term lodgings to accommodate this temporary increased demand for housing.

Of the peak construction workforce, approximately 16 out-of-state workers are expected to seek temporary (non-transient) housing in Kittitas County. There were more than 1,000 vacant seasonal, recreational, or occasional-use housing units in Kittitas County in 2000 (see Section 3.7.1). Given the recent rental vacancy rates of between 3.9 to 7% in Kittitas County, it is anticipated that there would be an adequate local housing supply available to accommodate project-related demand for temporary rental housing (Sagebrush Power Partners LLC 2003a, Section 8.1.3.1).

Employment

Project construction would result in increased employment in Kittitas County. Direct employment refers to the number of workers directly employed in project construction. Indirect and induced employment is discussed later in this section under the header “Indirect Construction Impacts.”

As described above, the direct construction employment impact of the project would be approximately 253 new temporary jobs. The level of direct construction impact would vary during the construction period, reaching a short-term peak estimated at 160 construction workers. The project’s direct construction employment would represent a temporary increase in employment for the local and regional economy. It is estimated that about 30 to 50% of this direct employment impact (76 to 127 jobs) would occur within Kittitas and Yakima counties, with the remainder distributed among other local economies in the Northwest. The Applicant assumes that local Kittitas County residents would fill approximately 40 full- and part-time construction jobs (including construction management) (Sagebrush Power Partners LLC 2003a, Section 8.1.3.2). Direct employment impacts from construction would be temporary effects associated with the construction phase of the project. The number of direct construction jobs generated by the project is anticipated to be the same under the three different project scenarios.

Construction jobs created by the project would result in short-term benefits to overall county and regional employment. No significant direct impacts on employment are anticipated. Creation of new jobs could have secondary impacts on population, housing, and the economy; these potential impacts are analyzed in relevant subsections of this chapter.

Construction Income

Total direct income generated during the construction phase of the project is estimated to be \$4,577,100 (in 2002 dollars) under the middle scenario. Total income consists of personal income in the form of wages, profits, and other income received by workers and business owners, plus income from other sources such as royalty payments to land owners who lease land for the turbines (Sagebrush Power Partners LLC 2003a, Section 8.1.3.2). The direct income impact from project construction would be a temporary but beneficial effect to the Kittitas

County economy. The amount of direct construction income generated under the lower and upper end scenarios is estimated to be +/- 10 to 15% of the quantified middle scenario.

Indirect Construction Impacts

Employment and Income

While the KVVPP is expected to create construction employment, economic impacts are not limited to those directly created jobs. Direct economic impacts produce a ripple effect through an economy in the form of indirect impacts and induced impacts. Indirect and induced impacts represent the second and third stages of job creation, respectively, as a result of any direct activity. A project or action that results in new spending, or a reduction in existing spending, is called a direct effect. The businesses that make the final sales must in turn purchase goods and services from other businesses; these indirect purchases are called indirect effects. For example, a construction contractor working on a project will lease some equipment or purchase supplies locally. Finally, workers at the producing businesses spend their wages in the local economy and purchase additional goods and services; these purchases are referred to as induced effects. For example, project employees who use their income to buy groceries or take their family to the movies generate economic impacts for workers and businesses in these sectors. The total economic impact of an action is the sum of direct, indirect, and induced effects. Indirect and induced construction employment impacts for the project were determined using an input-output model of Kittitas County (ECONorthwest 2002).

The direct, indirect, and induced employment and income impacts in Kittitas County during project construction (under the middle scenario) are shown in Table 3.7-10. The table identifies the number of full- and part-time jobs expected to result from the project and from the increase in spending in other sectors of the economy. The Applicant assumes that the project would directly generate 40 full and part-time construction jobs (including construction management) that would be filled by local workers in Kittitas County (Sagebrush Power Partners LLC 2003a, Section 8.1.3.2) under all three project scenarios. The total indirect and induced employment impact of the project under the middle scenario is predicted to be 14 and 28 jobs, respectively. The number of indirect and induced construction jobs generated under the lower and upper end scenarios is estimated to be +/- 10 to 15% of the quantified middle scenario. It is important to note that indirect and induced employment created by construction employment would not necessarily also be new construction jobs; everyday spending for construction materials and other similar needs could create new jobs in other markets sectors such as retail and wholesale. Direct, indirect, and induced employment impacts from construction would be temporary effects associated with the construction phase of the project.

The construction phase of the project for the middle scenario is projected to result in over \$5.7 million in total income in Kittitas County (Sagebrush Power Partners LLC 2003a, Section 8.1.3.2). The amount of direct, indirect, and induced construction income generated under the lower and upper end scenarios is estimated to be +/- 10 to 15% of the quantified middle scenario.

Table 3.7-10: Summary of Direct, Indirect, and Induced Employment and Income Impacts during Project Construction (2002\$) for the Middle Scenario

Impact Type	Jobs	Total Income
Direct	40	\$4,577,100
Indirect	14	\$518,100
Induced	28	\$701,800
TOTAL	82	\$5,797,000

Source: ECONorthwest 2002, as amended by Sagebrush Power Partners LLC 2003c.

Direct Operations and Maintenance Impacts

Population

Table 3.7-11 shows the estimated staffing for operations and maintenance of the completed wind power project under the three project scenarios. Operation of the Kittitas Valley Wind Power Project is projected to require between 12 to 14 full-time employees under the lower end and middle scenarios and between 18 to 20 full-time employees under the upper end scenario. Based on past experience for similar projects, it is estimated that approximately one-half of the total workforce employed to operate and manage the wind power project would be represented by local workers from Kittitas County (Sagebrush Power Partners LLC 2003a, Section 8.1.3.3; Taylor, pers. comm., 2003). The remaining workers would represent a net increase in local population. Using a typical household size factor of 2.3 persons per household (the Kittitas County average in 2000), the estimated total additional population related to project operations and maintenance would range from 16 (under the lower end and middle scenarios) to 23 individuals (under the upper end scenario).

Table 3.7-11: Operations and Maintenance Labor Force (Number of Personnel)

Position	82 Turbines/3 MW (Lower End Scenario)	121 Turbines/1.5 MW (Middle Scenario)	150 Turbines/1.3 MW (Upper End Scenario)
Plant/Site Manager	1	1	1
Operations Manager	1	1	1
Operating Technicians	8-10	8-10	14-16
Administrative Manager	1	1	1
Administrative Assistant	1	1	1
Total	12-14	12-14	18-20

Source: Sagebrush Power Partners LLC 2003a, Section 2.12.4

Housing

Assuming that the local (Kittitas County) labor market would supply about half of the project's operations employment needs, the projected demand for local housing would be nominal. The largest demand for housing would be generated under the upper end scenario, which is expected

to result in a maximum net in-migration of 10 families. Given the number of vacant housing units in Kittitas County reported in the 2000 census (3,093 units) and a vacancy rate of 6.8% for rental units, there appears to be sufficient housing supply available to accommodate the slight increase in direct housing demand generated by project operations.

Employment

The addition of between 12 to 20 full-time positions to operate the Kittitas Valley Wind Power Project would be less than 0.2% of total county employment. Nonetheless, the permanent jobs created through the project would translate into a small increase in local employment opportunities and would result in long-term benefits to overall county employment. No significant direct impacts on county employment are anticipated.

Property Values

Whenever land uses change, the concern is often raised about the potential effect on nearby property values. Zoning is the primary means that most local governments use to protect property values. By allowing some uses and disallowing others, or permitting them only as conditional uses, conflicting uses are avoided. Some residents in the project area consider the proposed wind turbines to be an incompatible use adjacent to rural residential areas. At the EFSEC land use hearing on May 1, 2003 in Ellensburg, Washington, the Applicant acknowledged the proposed project is not consistent with existing Kittitas County zoning for the project site (see Section 3.6, Land Use and Recreation, for further detailed discussion).

Several comments were raised during the EIS scoping period concerning the proposed project's effects on nearby property values. Some commentors requested that the EIS consider the effect of aesthetics and impacts to viewsheds on property values and that the property value study include interviews with tax assessors, real estate brokers, and bankers. Other commentors requested that the EIS include information on the probability and amount of change expected to local property values affected by the project and that the property value discussion be based on a hedonic analysis of properties surrounding the proposed project. (Note: a hedonic analysis requires that site-specific data on a number of quantitative and qualitative variables be used to predict housing values.)

A new analysis of impacts to property values of wind energy projects was beyond the scope of this EIS. However, a literature search was conducted to identify existing studies that addressed the relationship between wind development and property values. Based on this literature search, five studies relating wind development and property value effects were identified. The results of those five studies are summarized below.

Renewable Energy Policy Project

In May 2003, a study conducted by the Renewable Energy Policy Project (REPP) of Washington D.C. with funding from the U.S. Department of Energy, entitled *The Effect of Wind Development on Local Property Values*, was published (REPP 2003). Prior to publication of the REPP study, no systematic study on the effect of wind development on property values had been conducted in

either the United States or Europe. The REPP study reviewed data on property sales in the vicinity of wind projects and uses statistical analysis to determine whether and the extent to which the presence of a wind power project has had an influence on the selling prices of surrounding properties. The hypothesis underlying the report is that if wind development can reasonably be claimed to impair property values, then sales data should show a negative effect on property values within the viewshed of the projects.

The first step in the report's analysis required assembling a database covering every wind development that became operational after 1998 with 10 MW installed capacity or greater. For the purposes of the analysis, the wind developments were considered to have a visual impact for the area within 5 miles of the turbines. The 5-mile threshold was selected because review of the literature and field experience suggests that although wind turbines may be visible beyond 5 miles, beyond this distance they do not tend to be highly noticeable, and they have relatively little influence on the landscape's overall character and quality.

Records for all property sales for the viewshed surrounding the wind projects were gathered for a period of approximately 6 years (1996-2001). Similar data were gathered for a "comparable community," defined as a reasonably close community with similar demographic, economic, and geographic characteristics and trends compared to properties within the viewshed, but one that is outside of the viewshed area and does not contain large wind turbines. The study used standard simple statistical regression analyses to determine how property values changed over time in the viewshed and the comparable community.

The REPP study examined price changes for ten different wind projects throughout the country in three ways:

- Case 1 examined the price changes in the viewshed and comparable community for the entire period of the study (3 years preceding and 3 years following the on-line date of the project). For the ten projects analyzed, property values increased faster in the viewshed in eight of the ten projects. In the two projects where the viewshed values increased slower than for the comparable community, special circumstances made the results questionable. For example, Kern County, California, has had wind development since 1981. Because of the existence of old wind machines, the site does not provide a look at how the new wind turbines would affect property values. For Fayette County, Pennsylvania, the statistical explanation was very poor; for the viewshed the statistical analysis could explain only 2% of the total change in prices.
- Case 2 examined how property values changed only in the viewshed before and after the project came on line. For the ten projects analyzed, in nine of the ten cases the property values increased faster after the project came on line than they did before. The only project to have slower property value growth after the on-line date was Kewaunee County, Wisconsin. However, because Case 2 looked only at the viewshed, it is possible that external factors drove up prices faster after the on-line date and the analysis is therefore picking up a factor other than the wind development.
- Case 3 examined how property values changed in the viewshed and comparable community after the project came on line. For nine of the ten projects analyzed, property values increased faster in the viewshed than they did for the comparable community. The only

project to see faster property value increases in the comparable community was Kern County, California. The same caution applied to Case 1 is necessary in interpreting these results.

In summary, the study found that for the great majority of projects, the property values rose more quickly in the viewshed than they did in the comparable community. Moreover, values increased faster in the viewshed after the projects came on line than they did before. Finally, after projects came on line, values increased faster in the viewshed than they did in the comparable community. In all, of the 30 individual cases analyzed, the study found that in 26 of those, property values in the affected viewshed performed better than in the comparable community (REPP 2003).

ECONorthwest

A 2002 qualitative study titled *Economic Impacts of Wind Power in Kittitas County* (ECONorthwest 2002) involved conducting a telephone survey of property tax assessors throughout the country in counties that recently had wind turbines installed in their areas. This survey covered 22 projects in 13 counties. Of the 13 counties, six had residential properties with views of a wind farm, six had no residential properties with views of a wind farm, and one reported that the wind project was too new to assess property value impacts. The results of this survey concluded that there is no evidence that views of wind turbines decreased property values (ECONorthwest 2002). The weakness of the study is that it relies on subjective comments to arrive at its conclusion (REPP 2003).

Sinclair Knight Mertz

A 2001 qualitative study titled *Social Economics and Tourism* (Sinclair Knight Mertz 2001) concluded that for highly sought after properties along Salmon Beach, Australia, closer than 200 meters from wind turbines, the general consensus among local real estate agents was that “property prices next to generators have stayed the same or increased after installation.” However, the study concluded that while properties with wind turbines on them may increase in value, other properties may be adversely affected if within sight or audible distance of the wind turbines.

Jørgensen

A 1996 quantitative Danish study, *Social Assessment of Wind Power* (Jørgensen 1996) applied statistical regression analysis to determine the effect of 102 windmill installations, including individual wind turbines, small wind turbine clusters, and larger wind parks on the value of 74 residential properties. The regression used the hedonic method, in which site-specific data on a number of quantitative and qualitative variables is used to predict housing values. The study concluded that homes close to a single wind turbine or a windmill park with 12 windmills ranged in value from Danish kroners 16,200 to 94,000 [approximately \$2,900 to \$16,800 in 1996 dollars] less than homes further away. The study cautions, however, that not all of its results are statistically significant, mainly because the data set (74 properties) is not sufficiently large (Jørgensen 1996).

Damborg

The qualitative study *Public Attitudes Towards Wind Power* (Damborg 2002) summarizes the results of a public opinion poll about wind power in the Danish municipality of Sydthy (Andersen et al. 1997). Sydthy has 12,000 inhabitants and more than 98 percent of the total electricity consumption is covered by wind power, making Sydthy one of the places in the world with the highest concentration of wind turbines. The Sydthy opinion poll shows that people with a high degree of knowledge about energy generation and renewables tend to be more positive about wind power than people with little knowledge.

The study indicated that distance to the nearest turbine has no effect on people's attitudes towards wind turbines in general. This indicates that people living close to wind turbines do not consider noise and visual impact to be significant problems; in particular, people living closer than 500 meters to the nearest wind turbine tend to be more positive about wind turbines than residents further away (Damborg 2002).

Conclusions

The REPP study is the most recent and most comprehensive statistical study evaluating the correlation between wind development projects and nearby property values in the United States. The findings of most of the prior studies reviewed for this EIS were based on qualitative data. The only quantitative study of those reviewed (*Social Assessment of Wind Power*) cautioned that its results were not statistically significant.

The REPP study cautions that it is an empirical review of changes in property values over time and does not attempt to present a model to explain all influences on property values. However, the statistical analysis provided in the REPP study provides no evidence that wind development had harmed property values within the viewshed (REPP 2003). Furthermore, non-project factors, including the presence of the existing Bonneville and PSE transmission line towers, along with other general market factors, are already reflected in the market value of properties in the KVVPP area. Therefore, based on the evidence presented in the REPP study, no long-term impacts to property values are expected as a result of the proposed project.

Indirect Operations and Maintenance Impacts

Employment and Income

The estimated number of direct, indirect, and induced jobs created in Kittitas County as a result of project operations under the middle scenario are shown in Table 3.7-12. During operations, it is estimated that 9 local workers from Kittitas County would be employed to operate and manage the wind project. The total indirect and induced employment impact during project operations is predicted to be 1 and 13 jobs, respectively, for a total of 24 additional jobs in Kittitas County (Sagebrush Power Partners LLC 2003a, Section 8.1.3.3).

Table 3.7-12: Annual Employment and Income Impacts in Kittitas County during Operations (2002\$) for the Middle Scenario

Impact Type	Jobs ¹	Total Income
Direct	9 ²	\$1,489,400
Indirect	1	\$59,400
Induced	13	\$436,700
TOTAL	24	\$1,985,500

Source: ECONorthwest 2002, as amended by Sagebrush Power Partners LLC 2003c.

1 Total may not add because of rounding.

2 Note that the estimated number of direct operations jobs assumed in the county input-output model is consistent with the Applicant's estimate under the upper end scenario (see Table 3.7-11). However, the difference between the Applicant's estimates regarding the number of direct operation jobs under the middle and upper end scenarios is minor (two to four jobs), and this number is only a rough estimate. Therefore, for purposes of this analysis, the input-output model results are considered an adequate representation of the middle scenario.

Spending on equipment and other materials would be necessary to operate and maintain the wind turbines. The ECONorthwest study assumed that property owners who lease land for the wind turbines would receive a combined \$544,000 per year in income (approximately \$4,500 per turbine). Table 3.7-12 also shows the projected annual direct, indirect, and induced income created by the project during operations under the middle scenario. The project is projected to result in nearly \$2 million per year in added income (Sagebrush Power Partners LLC 2003a, Section 8.1.3.3). The amount of direct, indirect, and induced income created during project operations under the lower and upper end scenarios is estimated to be +/- 10 to 15% of the quantified middle scenario. Induced Effects of Tourism

During the EIS scoping process, members of the public requested that the economic impacts associated with tourism generated by project operations be addressed as part of the EIS analysis. New tourists who visit and spend money in the project area could generate induced economic effects in the local economy.

According to the Applicant, experience suggests that wind power projects increase tourism. One wind power project in England had over 350,000 visitors in its first eight years. In Washington State, the Stateline Wind Power Project near Walla Walla had more than 1,600 visitors who took guided tours in its first three months of operation (Sagebrush Power Partners LLC 2003d). Based on this experience, it is likely that tourists would be attracted to the KVVPP area. However, the projected volume of visitors to this project area, either on a daily or annual basis, is unknown. Similarly, it is unknown to what extent visitors attracted to the project area would represent new tourists that otherwise would not have visited.

The Kittitas County economy is characterized by seasonal employment. In 2000, seasonal industries accounted for 20% of all private covered employment in Kittitas County, considerably higher than the state's 14.1%. This higher concentration of workers in seasonal industries compared to the state is primarily due to its large agricultural sector (Washington State Employment Security Department 2002a). In an economy such as Kittitas County's it would be expected that induced employment would tend to be absorbed. That is, rather than mobilizing and demobilizing to service particular projects or seasonal events, the local economy and infrastructure can absorb and respond to temporary economic events. For example, swings in

revenue are experienced by local businesses but do not necessarily result in constant hiring and firing (Golder Associates 2002). Based on this assumption, impacts from induced employment during proposed project operations, including employment induced through a potential increase in local tourism, are not considered to be significant, although local businesses are likely to experience increases in income. However, in the absence of specific data, the potential induced economic effects of tourism are uncertain (see Section 1.7, Issues to be Resolved).

Local Government Taxation and Revenues

The proposed KVVPP would increase the amount of annual property tax revenue to Kittitas County. The tax revenue analysis prepared by ECONorthwest was based on review of Kittitas County budgets and spending and assumes a value of \$750,000 per turbine and a property tax rate of 1.35 for Kittitas County. The results of the ECONorthwest study have been updated to reflect the proposed wind turbine configuration under the middle scenario.

Under this scenario, the project would generate an increase of \$1,249,600 in annual property tax revenue to Kittitas County. In addition, project development would have a beneficial indirect effect on the value of other local properties because of the increase in wages and overall economic activity in Kittitas County. This secondary, indirect effect would result in an additional \$93,500 in property taxes annually in the county. Thus it is estimated that Kittitas County would receive an estimated total of \$1,343,100 in added property tax revenue each year under the middle scenario (Sagebrush Power Partners LLC 2003a, Section 8.1.3.5, as amended by Sagebrush Power Partners LLC 2003c). The effects of the lower and upper end scenarios on local tax revenues have been estimated at +/- 10 to 15% of the quantified middle scenario.

Assuming that revenue would be distributed consistent with the spending patterns in Kittitas County's 2002 budget, the added revenue would be distributed as shown in Table 3.7-13. As shown, the largest beneficiaries of the added revenue would be local and state schools, followed by county government, county roads, local communities, and hospitals and other local services.

Table 3.7-13: Allocation of Added Annual Property Tax Revenue in Kittitas County for the Middle Scenario

Spending Category	Amount
Local schools	\$407,000
State schools	\$376,200
Fire districts	\$80,300
Local communities	\$112,200
County roads	\$135,300
County government	\$168,300
Hospitals/other local services	\$63,800
Total	\$1,343,100

Source: ECONorthwest 2002, as amended by Sagebrush Power Partners LLC 2003c.

Kittitas County would receive other fiscal benefits from the project such as increased sales and use taxes, license and permit fees, and charges for services. The additional tax revenues to

Kittitas County for the middle scenario are shown in Table 3.7-14. In addition to \$304,700 in property taxes for county government and roads, Kittitas County would receive \$18,700 from other sources. The effects of the lower and upper end scenarios on local tax revenues have been estimated at +/- 10 to 15% of the quantified middle scenario. These indirect effects would have a positive impact on the local economy.

Table 3.7-14: Additional Kittitas County Government Tax Revenues for the Middle Scenario

Spending Category	Amount
Property taxes - county government and roads	\$304,700
Sales and use taxes	\$3,300
All other taxes	\$1,100
Licenses and permits	\$1,100
Charges for services	\$4,400
Fines and forfeits	\$1,100
State collected taxes distributed to the county	\$7,700
Total	\$323,400

Source: ECONorthwest 2002, as amended by Sagebrush Power Partners LLC 2003c.

During the EIS scoping process, many comments were received on the issue of tax revenues generated by the proposed project. For example, one commentor requested that the EIS describe how a “compatible” commercial use would be taxed on land currently designated as open range. The same commentor also asked if project area lands would be reclassified to reflect the new commercial use, and requested a discussion of how the tax base would increase and if increased tax revenues would stay in the area. Another commentor asked if property taxes would go down if the project is built under Initiative 747 (I-747). Classification of the project area for taxing purposes is a decision made by the Kittitas County Assessor. Potential tax revenues generated by the proposed project, and the effects of I-747, are discussed below.

The ECONorthwest study acknowledged that a possible effect of the added tax base would be to reduce other taxes, thereby reducing the projected increase in tax revenue discussed above. Washington State Initiative I-747 limited property tax levy increases to 1% per year. Assuming that \$500,000 of the value of a wind turbine would be assessed as personal property, installing 121 wind turbines under the middle scenario would increase the total property value of Kittitas County by \$60.5 million, which is a 2.6% increase (Sagebrush Power Partners LLC 2003a, Section 8.1.3.5). Because this is greater than the one-percent increase limit imposed by I-747, it is possible that other taxes would need to decline to remain under the 1% limitation. However, the ECONorthwest study concluded that regardless of whether the new turbines would result in an increase in property tax revenue or enable a reduction in other taxes, the project would bring substantial property tax benefits to Kittitas County (Sagebrush Power Partners LLC 2003a, Section 8.1.3.5).

Decommissioning Impacts

Upon decommissioning, the project site would be restored according to plans developed by the Applicant and reviewed and approved by EFSEC, in compliance with WAC 463-42, 655-665. If subsequent economic uses of the project site were not developed, facility closure would represent a long-term loss of employment and associated economic activity for the local and regional economy and a loss of tax base. For example, up to 20 full-time jobs created as part of the project (under the upper end scenario) would be eliminated. It is assumed that individuals employed in these jobs would seek employment from other sources and that this loss of employment would have adverse impacts on the individuals involved. However, the number of jobs eliminated would be small compared to the number of jobs in Kittitas County as a whole (11,822 in 2000). Therefore, a very minor adverse impact to county employment would be anticipated as a result of project decommissioning.

If the project were decommissioned and facilities were removed from the study area, property tax revenues would decrease accordingly. This loss of revenue would likely have a slight adverse impact on the local economy. Decommissioning the facility would require removing most project facilities and reclaiming disturbed areas. These activities would result in beneficial but temporary construction employment similar to that projected for facility construction.

3.7.3 Impacts of No Action Alternative

Under the No Action Alternative, the project would not be constructed or operated and the region's socioeconomic conditions would remain unchanged from current patterns and trends. Local providers of transient housing and other goods and services would not experience temporary increases in demand for their facilities, and Kittitas County would not benefit from the tax revenues and employment opportunities resulting from the proposed project.

If the project were not constructed, the region's power needs could be delivered through development of other generation facilities such as a gas-fired combustion turbine. Although the impacts of a combustion turbine would depend on its location, the specific socioeconomic impacts would likely be of a similar magnitude to the proposed project. For example, operation of a combustion turbine generating about 60 MW would employ about 10 people, slightly less than the project's anticipated level of full-time operations and maintenance workers.

3.7.4 Mitigation Measures

To minimize the potential increase in visitors to the project site, the Applicant proposes to construct an information kiosk and public viewing area near the proposed O&M facility off Bettas Road. Signs would be provided to direct tourists to this viewing area (see Chapter 2, Proposed Action and Alternatives, Section 2.2.3, Facilities). No other mitigation measures are required or have been identified for potential socioeconomic impacts.

3.7.5 Significant Unavoidable Adverse Impacts

The proposed action would have no significant unavoidable adverse impacts to the socioeconomic health of the project region. Although the specific employment, income, and tax revenue effects under the lower and upper end scenarios during construction and operations have yet to be quantified, they would likely be beneficial to the local economy. Furthermore, while the potential induced economic effects of tourism are uncertain, impacts from employment induced through a potential increase in local tourism are not considered significant or adverse.